The 'Me' in Meaning: People high in narcissism find comfort and meaning in selfie likes.

by

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1. Abstract

It is well known that narcissists struggle to form meaningful relationships as they lack empathy and consideration for others. However, they rely on social validation to maintain a heightened self-view and mask an insecure core. Narcissists show heightened reactions to social exclusion with recent research showing heightened distress at a neural level. The current research aimed to extend on this by investigating whether or not the social pain following exclusion could be reduced from posting selfies on Instagram and receiving validation in the form of 'likes'. As hypothesized posting a selfie and receiving likes following ostracism significantly reduced distress observed through P3a amplitude. Furthermore, the current study suggests narcissists gain meaning in life from validation (likes) of selfie posts.

2. Introduction

Narcissists. They show up daily in celebrity magazines or on reality television shows, and some even run countries. Narcissism is on the rise and has been for some years (Twenge & Campbell, 2009). Also on the rise is social media, such as Facebook, Twitter, and Instagram. Social media seems to hold special appeal to narcissists. We wondered whether social media platforms are providing narcissists with the perfect arena to feed their self-indulgent needs. Specifically, based on classic and contemporary views of narcissism, the current research examines whether or not narcissists find relief from insecurity and an unrealistic sense of meaning from posting personal pictures (selfies) on Instagram.

2.1 Narcissism

Narcissistic individuals are characterized by overt vanity (Maaß, Lämmle, Bensch, & Ziegler, 2016). This overt display of confidence and superiority, however, may be belied by a covertly vulnerable sense of self (Cascio, Konrath & Falk, 2015). For example, clinical theories have suggested that narcissists seek social affirmation and validation to mask deep-seeded feelings of insecurity and self-doubt (Akhtar & Thomson, 1982). Self-report measures show largely positive outcomes associated with narcissism such as low levels of anxiety (Cascio, Konrath and Falk, 2015) however, neurophysiological measures can peek under that putatively compensatory shell. Narcissists have been shown to respond to social exclusion with heightened activity in social pain networks, suggesting their exaggerated reactions to exclusion may be due to hypersensitivity (Cascio, Konrath & Falk, 2015).

Narcissists experience interpersonal problems as well. Their self-aggrandizing pursuits first appear charming, but quickly wear thin as narcissists have trouble forming and maintaining close relationships (Bergman, Fearrington, Davenport, & Bergman, 2011). Given that they prioritize self over others, it is not surprising that narcissists display reduced empathy and ability to relate. Thus, the narcissists face a dilemma. Relationships are their source of compensatory self-worth, but pursuing these asymmetric relationships leads to relationship dissolution. And their outward show of confidence and superiority appears to be cover for an inward sense of doubt and insecurity. Could social media give Narcissists the perfect solution, however? that is, might social approval over the internet allow people to meet their narcissistic needs without having to face the dilemma of forming close relationships? This question is important because both narcissism and the use of social media are on the rise.

2.2 Generation me

Today's youth and young adults are referred to as 'generation me', a generation found to be more entitled, narcissistic, materialistic and who 'want it now' (Opree & Kühne. 2016). This generation has grown up in a technology fueled society with a large focus on individuality and success. Social comparison and approbation is accessible anywhere via social media, and feedback from peers or a global audience is an upload away providing generation me with a stage for grandiose displays. This generation has been found to be more narcissistic than past generations and has even sparked research around a 'narcissism epidemic' (Twenge, Konrath, Foster, Campbell & Bushman, 2008; Twenge & Campbell, 2009). So, why is it important to better understand narcissism while in continues to increase in today's society? Narcissism has short term positive outcomes for the individual such as enhanced first impressions and likability

in social situations (Oltmanns, Friedman, Fiedler, & Turkheimer, 2004; Paulhus, 1998), and better performance on tasks involving public evaluations (Wallace & Baumeister, 2002). However, these are short lived victories and as time goes on the negative effects of narcissism are seen for both the individual and others. For example, narcissists show heightened aggression (Barry, Chaplin, & Grafeman, 2006), troubled intimate relationships (Campbell, Foster, & Finkel, 2002; Foster, Shrira, & Campbell, 2006), risky decision making (Campbell, Goodie, & Foster, 2004), and antisocial reactions to social threats (Barry, Chaplin, & Grafeman, 2006). The anti-social reactions of narcissists to social exclusion is an area that has received a large amount of focus, however only recently have neural measures been used to better understand the underlying vulnerability of narcissistic individuals that are not present in self-reports (Cascio et al., 2015; Jauk, Benedek, Koschutnig, Kedia & Neubauer, 2017). A better understanding of narcissists reactions to social exclusion using a combination or neural measures and self-reports could provide opportunity to implement interventions for generation 'me'.

2.3 Social Exclusion and Narcissism

Social connection is a fundamental need for humans (Leary & Baumeister, 1995). Early humans had to stick together for survival purposes (Baumeister, Brewer, Tice, & Twenge, 2007). Social bonds were reinforced by feelings of pleasure and security and when left involuntarily alone feelings of unease drew attention to possible danger (Cacioppo & Patrick, 2008).

Research has shown that merely believing one has a social system to garner support from predicts improved physical and psychological health, speedier recovery from illness and stress (Konrath & Brown 2012), and significantly reduced risk of morbidity and mortality (Holt-

Lunstad Smith & Layton, 2010). On the other hand, a lack of close social connections or damaged social bonds can result in unhappiness, depression, anxiety and distress (Baumaister & Leary 1995). However, the intensity of reaction to social exclusion differs among individuals. Some people find it easier to brush off exclusion unless it poses a serious threat to their social bonds, while others are hypersensitive to any hint of social exclusion, real or imagined (Nezlek, Kowalski, Leary, Blevins & Holgate 1997).

Research on narcissism and social exclusion has focused heavily on externalising reactions, such as heightened aggressive behaviour (Baumeister, Smart & Boden, 1996; Bettencourt, Talley & Valentine, 2006; Twenge & Campbell, 2003;). Distress in narcissism has received very little to no attention which may be due to narcissists self-reports of low distress (Cascio et al., 2015) and their grandiose and confident presentation (Maaß, Lämmle, Bensch, & Ziegler, 2016). Anxiety and distress has been shown to cause a number of long-term detrimental effects including depression, illicit drug use, educational underachievement, and suicidal behaviour (Woodward and Fergusson, 2001); these effects may be particularly pronounced for narcissists who refuse to admit feeling anxious and choose immediate happiness over distant but long term rewards (Buelow and Brunell, 2014). This may result in temporarily masking distress as opposed to finding a long-term fix. Cascio et al., (2015) were one of the first to research the neural responses of narcissists to social exclusion. Despite the buffering characteristics that narcissists report they displayed an exaggerated neural response in the putative social pain network throughout a social exclusion experience. This study has highlighted the need to include neural responses along-side self-reports when researching in the area of narcissism and social exclusion. Their study has also shone a light on the lack of research on narcissists recovery from

the social pain of ostracism. Could affirmation online through social networking sites provide narcissists with the compensation they need to mask their insecurity without the need for empathy or consideration of others?

2.4 Narcissism and Social Networking Sites

A social networking site is a web-based service allowing users to create a personal profile to connect with others on a global scale (Boyd & Ellison, 2007). Instagram is a social networking site that has focused on posting images and videos rather than status updates and provides a number of filters to improve or retouch images before posting them. As of September 2016, Instagram was ranked as the eighth most popular social networking site with 500 million active accounts worldwide (Statista, 2016). Instagram users can choose to have their account private or public, other users can follow people's pages, or request to follow private profiles which allows them to see the images and videos uploaded, and like or comment on other people's posts. When uploading pictures to Instagram users can edit images by applying filters, changing colours and cropping to create the perfect photo to upload to their online audience. With smart phones being enabled with apps that connect people straight to social networking sites they now have the ability to reach a large audience at all times. Instagram users also include hashtags in their photo caption to ensure their image reaches a larger audience. A hashtag is commonly used to highlight the key themes of the image being posted. For example, many users upload images around exercise and healthy eating. To reach more users, the hashtags #fitspo, #fitspiration, and #cleaneating could be used. This means that this image will appear on the corresponding Instagram pages for these hashtags and have the potential to be seen by a global audience. Social networking sites have also given rise to the 'selfie'. Selfies are frequently posted on social

networking sites, and are defined as "photographs that one has taken of oneself, typically taken with a smartphone or webcam and shared via social media" (Lee & Sung 2016 Pg. 347). With self-presentation becoming normal on social networking sites could this be the perfect stage for narcissists to put on a grandiose show?

If narcissists reliably seek validation and affirmation from external sources, are social networking sites providing 'generation me' with the perfect avenue to do this? They require little empathy or consideration for others and remove the need for narcissists to deal with real social interactions yet continue to provide the affirmation they seek to mask their insecure core. Social networking sites such as Facebook and Instagram allow users to enhance their photos using filters and editing tools before uploading to a potentially global audience who can provide instant feedback. This technology appears to be perfect for narcissists allowing them an opportunity to present themselves to a social audience in the way they wish to be perceived. Research has shown narcissists are indeed more active on these sites and post selfies more frequently (Barry, Douchette, Loflin, Rivera-Hudson, & Herrington, 2015) Research on narcissism and social networking behaviour has found narcissism to have a significant relationship with more frequent selfie posting (Barry, Douchette, Loflin, Rivera-Hudson, & Herrington, 2015), larger amounts of self-promotional content in status updates and profile pictures on Facebook (DeWall, Buffardi, Sonser & Campbell, 2011) and higher levels of self-reported attractiveness in selfies (Re, Wang, He, & Rule, 2016)

Are social networking sites the perfect tool in the narcissist's hunt for validation? Do selfies provide the much desired and needed affirmation for narcissists to recover from threats?

The question remains do social networking sites provide sufficient validation for narcissists or is it a poor substitute for real life interaction.

Also in question is how selfie posting on social networking sites effects narcissists sense of meaning. Research has shown narcissists focus on happiness rather than meaning, prioritizing short term pleasure over long term growth (Buelow and Brunell, 2014). However, Abeyta, Routledge, and Sedikides (2017), found narcissists derive meaning from extrinsic goals such as fame or status, while others tend to find meaning in intrinsic goals, such as giving back to the community. This suggests that narcissists find meaning in their pursuits for social approval and superiority. Thus, social media approval might lead to more meaning for the narcissist.

2.5 The Current Study

The current study took a social neuroscience approach to investigate the use of social networking sites and selfie posting as a buffer against distress in narcissists following ostracism. Electroencephalography (EEG) measures were used to monitor distress to ostracism through p3a amplitude EEG signals known as event related potentials to a startling auditory stimuli. Participants then took part in one of three activities based on the condition (selfie upload + likes, selfie upload only, no selfie). In the selfie with likes condition participants took and uploaded a selfie to their Instagram account via their phone, then received bogus but extremely realistic feedback in the form of 'likes' which were manipulated by the experimenter. It was expected that narcissistic participants would show the greatest reduction of distress in this condition as it would support the psychodynamic view of narcissists as requiring admiration to mask an insecure core (Akhtar & Thomson, 1982). Participants in the selfie only condition took and

uploaded a selfie to their Instagram account through their phones but did not receive likes. This condition was included to explore whether the feedback was necessary to mask distress following social exclusion or whether the self-presentation was enough. Finally, the control condition involved looking at a neutral image (Gable & Harmon-Jones, 2008) on Instagram and involved no selfie taking or uploading. It was expected that participants high in narcissism in the control condition would show no significant reduction in anxiety as they were not provided with an avenue for self-presentation which has been shown to buffer the effects of social threat (Horvath, & Morf, 2010). EEG measures were used to monitor the change in p3a amplitude after exclusion and after the selfie manipulation while self-reports measured happiness & meaning, self-esteem, trait self-control, and narcissism. This is the first study in the area of narcissism and social media to use EEG measures along-side self-report. Research has shown distress amongst narcissists following exclusion is more prominently seen in brain systems than in responding to self-reports (Cascio et al., 2015). Specifically, by using a combination of self-report and neural measures, the current study aims to test the following hypotheses:

Hypothesis 1 – Participants who score higher on the NPI will show the largest decrease in p3a amplitude (distress) in the selfies + likes condition compared to the selfie only and control conditions.

Research has suggested that narcissists seek social affirmation and validation to mask deep-seeded feelings of insecurity and self-doubt (Akhtar & Thomson, 1982), thus, it was hypothesised that validation in the form of 'likes' on selfies would decrease distress following social exclusion.

Hypothesis 1.1 – Participants low on NPI will show no significant reduction in P300 amplitude (distress) in the selfie or selfie + likes conditions.

Unlike narcissists who are driven by extrinsic goal, general population tend to be motivated by intrinsic goals (Abeyta, Routledge & Sedikides, 2017) thus, it is hypothesised that individuals low on narcissism will not find satisfaction in self-presentation on social media or through social validation.

Hypothesis 2 – Individuals who score higher on the NPI will show a significantly greater reduction in p3a amplitude (distress) in the selfie only condition compared to the control condition.

Narcissists have been shown to engage in a large amount of self-presentation behaviours especially following social threats (Morf & Rhodewalt, 2001). It was hypothesised that this behaviour may be enough to reduce distress following exclusion without the need for affirmation.

Hypothesis 3 – Higher NPI scores will be associated with hedonistic pursuits while those scoring lower on the NPI will score higher on eudaimonic pursuits.

Research has shown narcissists seek out short term happiness over long term meaning (Buelow and Brunell, 2014) thus, it was expected that narcissists would score more highly on hedonistic pursuits both pre-and-post condition exercises (selfie + feedback, selfie, gravel)

3. Method

3.1 Participants

83 (19 male, 64 female) 100 and 200-level Undergraduate students enrolled at the University of Canterbury took part in the current study in exchange for course credit (*M* age 20.8, SD 3.73).

3.2 Materials

Experiment room:

All 83 participants completed the experiment in the same light controlled room with all external windows covered. A maximum of four participants were able to complete the experiment at one time. A second room attached to the experiment room was used for participants to take their selfies. Only one participant would be in this room at any given time.

Computer and Headphones:

Each participant was randomly assigned to one of four computers in the experiment room. Each computer had a set of headphones attached. The computer was used to display questionnaires through Qualtrics, access the participants Instagram account, run the 'like' generating software, play Cyberball, and complete an audio oddball paradigm task on E-prime.

Personal Cell Phones

Participants were required to bring their cell phones with the Instagram app in order to be eligible to take part in the study. Some participants were to use their cell phone to take a selfie and upload this selfie to their Instagram account.

'Like' Generator Programme

A 'fake screen' was developed that could be opened over top of the current desktop display without the participant being aware. This fake screen then generated likes on the participants Instagram photos. The screen would appear to refresh every 10 seconds displaying a spinning loading wheel and the likes would gradually increase. All participants received the same pattern and number of likes (26) over a span of six minutes (see appendix G).

EEG Headsets and Software:

Electroencephalography (EEG) measures were recorded using the 14-electrode (gold-plated contact-grade hardened copper with felt pads moistened with saline) Emotiv EPOC+ headset and the Emotiv TestBench software (Emotiv Systems Inc., San Francisco, CA, USA). The headsets were placed on the participants scalp before beginning the experiment. An electrode was placed over each mastoid as an online reference point. Electrodes were also placed at AF3, AF4, F3, F4, F7, F8, FC5, FC6, P7, T7, T8, P8, O1, and O2 and data was sampled at a rate of 128 Hz. Research has validated Emotive EEG devices for the measurement of event related potentials and alpha suppression (Stopczynski, Stahlhut, Larsen, Petersen, & Hansen, 2014)

3.3 Dependent Measures

Narcissism

Narcissism was assessed using the Narcissistic Personality Inventory (NPI) (Raskin and Terry 1988) a 40-item scale including statements such as "I have a natural talent for influencing people", "I am a born leader" and "I like to be complimented". Participants scored each of the 40

statements on a scale of 1 (strongly disagree) to 5 (strongly agree). The scores for each item were summed, with high scores indicating higher levels of narcissism.

Meaning versus Happiness

Meaning and happiness were measured using the Meaning in Life Questionnaire (MLQ; Steger, Frazier, Oishi & Kaler 2006) a 10-item measure of the presence of meaning in life. Items include: "I understand my life's meaning", "I am always looking to find my life's purpose", and "I am seeking a purpose or mission for my life". Participants rated each item on a one to five Likert scale (1 = Strongly disagree, 5 = strongly agree). The scores from each item were summed and mean scores were calculated.

The Meaning in Life Questionnaire was included as an exploratory measure only as the study by Abeyta, Routledge, and Sedikides, (2017) was not yet published. Primarily, it was expected that narcissism would be associated with pleasure but not meaning following selfie posting and online affirmation.

Hedonic and Eudaimonic Pursuits

Hedonic and Eudaimonic pursuits were measured using the Hedonic and Eudaimonic Motives for Activities (HEMA) scale (Huta & Ryan 2010) a 10-item scale including items such as "I would like to seek relaxation", "I would like to seek enjoyment", and "I would like to pursue excellence or a personal ideal". Participants rated each item from 1 (strongly disagree) to 5 (strongly agree). The scores from each item were summed and mean scores were calculated.

Self-Esteem

Self-esteem was measured using the Rosenberg Self-Esteem (Rosenberg, 1986), a 10-item scale including items such as: “On the whole, I am satisfied with myself”, “I am able to do things as well as most other people”, and “I certainly feel useless at times”. Participants rated each item from 1 (strongly disagree) to 5 (strongly agree). The scores from each item were summed and mean scores were calculated.

Trait Self-Control

Trait self-control was measured using the Breif Self-Control scale (Tangney, Baumeister & Boone, 2004) a 13-item scale including items such as “I have a hard time breaking bad habits”, “I refuse things that are bad for me”, and “I have trouble concentration”. Participants rated items from 1 (strongly disagree) to 5 (strongly agree). The scores from each item were summed and mean scores were calculated.

3.4 Procedure

Participants signed up to a time slot and were provided with information on the lab location. Participants were told the study was focused on Instagram use and participants would be required to have an active Instagram account which they could access from their phone.

Upon arrival participants were asked to fill in their name on a sign-up sheet which randomly assigned them to one of the three conditions. Participants were also asked to choose one of four computers to sit at to maintain a random seat selection and combination of condition and computer location. Participants were then asked to read and sign the consent form.

Examiners then asked permission to fit participants with EEG headsets, following this, participants were instructed to begin answering the questionnaires on Qualtrics.

When the questionnaires reached a certain point, a screen appeared instructing the participant that they would now take part playing an online game against other online participants and to signal the examiner to begin the game. Participants played a game of Cyberball consisting of 26 ball tosses three of which involved the experiment participant.

Auditory Oddball Paradigm

Following Cyberball, participants were fitted with headphones and completed an auditory oddball paradigm. The paradigm consists of a series of beeps with infrequent and startling static noise bursts randomly occurring throughout to avoid patterns of events (García-Larrea, Lukaszewicz & Mauguiére, 1992). The current study used a ratio of 1:9 (static:beeps). Each stimulus was presented every second and the entire paradigm lasted for three minutes. Participants reactions to the startle and beep stimuli were measured using electroencephalograpy (EEG). Because EEG can be effected by large amounts of movement, participants were asked to fixate on a small cross on the screen to avoid excess movement.

Neural Measure of Distress

Event related potentials (ERPs) to stimulus during the oddball task presentation were indexed to an individual's distress level. Event related potentials measure neural activity related to cognitive, motor and sensory processes (Sur and Sinha, 2009). Event related potentials to startling stimuli in the auditory oddball task reliably demonstrate a characteristic wave form, first

involving a negative going deflection typically peaking at 200ms over central midline electrodes, commonly called the N2 component. This is followed by a positive going deflection peaking between 300-500ms over fronto-central and parietal electrodes, commonly called the P3 component. (Bressler & Ding, 2006; Patel & Azzam, 2005; Polich & Martin, 1992). Together, the N2-P3 complex is thought to reflect neurocognitive processing of startling stimuli in this paradigm (Polich & Martin, 1992). Notably, the P3 is comprised of two separate components; the P3a and the P3b. The P3a, typically peaking between 275-350ms, is of particular relevance to our current study as research suggests that the peak amplitude of this component is sensitive to both conflict and distress. For example, the P3a complex is enhanced during social exclusion and the P3a is related to negative mood following ostracism (Wang, Braunb & Encka, 2017). Therefore, we would expect P3a amplitude to reflect distress levels to social exclusion in this study.

Following the oddball paradigm, participants took part in one of three activities depending on the condition they were assigned to:

Condition 1 Selfie + Feedback:

In this condition participants were given instructions that they were to take a selfie to upload to Instagram with the following hashtags attached; #selfie #fitspo #fitspiration. The instructions informed the participant that the purpose of this exercise was to examine the use of hashtags and how they influenced social feedback in the form of 'likes'. Participants were taken to the allocated room attached to the computer lab where they were given time to take and edit their image on their phones. They were to show the examiner prior to uploading the image to

make sure the hashtags and sizing were correct. Participants then uploaded their selfie and handed their phone to the examiner to avoid distraction throughout the remainder of the study.

Participants returned to their desk where the examiner gave them another information sheet explaining that a screen refreshing software was about to be started to they could sit back and observe how many likes they received on their selfie. The fake screen 'refreshed' every 10 seconds and the likes increased to a total of 26 likes over six minutes. The participant was told the software would stop refreshing after approximately five minutes and to signal the experimenter when this happened.

Condition 2 – Selfie with No-Feedback:

Participants in the selfie only condition were told the same instructions as in condition one. They were escorted to the adjoining room to take and edit their selfie, showed the examiner and then uploaded their image to their Instagram account. These participants then handed their phones to the examiner to avoid distraction moving forward and continued onto the next task.

Condition 3 – No Selfie (Control):

Participants in the control condition did not take or upload a selfie to Instagram. Instead these participants observed a picture of gravel for 3minutes before moving on to the next task.

After participants completed their assigned condition task they were again fitted with headphones and completed the oddball paradigm task to measure distress. Following this, participants answered questionnaires on meaning in life, and hedonic and eudaimonic pursuits.

Post Experiment Data Analysis

The EEG data recorded throughout the two oddball paradigms was digitally filtered between 0.1 and 30 Hz. To remove error, artifacts (i.e., movement) were automatically detected and removed (using -75 and +75 μV threshold) from P3a calculation. Blinks were statistically removed using the second-order blind identification (SOBI) procedure (Tang et al., 2005). Artefact free trials went through EEG epoching (1000ms) and signal locked with the window starting 200ms before and ending 800ms after the presentation of the stimulus. Baseline was also corrected between -200 and 0 ms before stimulus. The P3a was quantified as the mean amplitude between 275ms to 375ms after both standard tones and startle stimuli at the fronto-central midline electrode F4 (based on the location of the maximal P3a value on the grand averaged ERP). Scores were calculated for each participant for both the post-cyberball P3a and the post-selfie condition P3a.

4. Results

Moderation Analyses

Multiple regression analyses using Hayes (2013) PROCESS macro with 5,000 bias-corrected bootstrapped resamples revealed that individual differences in participants narcissism interacted with condition to impact vigilance measured via EEG as P3a amplitude, $F(2, 75) = 3.902$, $p = .024$, $R^2 = .061$ (see Figure 1). Specifically, results revealed a non-significant effect on condition on P300 activity for participants low on narcissism (i.e., 25th percentile), $F(2, 75) = 2.224$, $p = .12$. However, decreased vigilance via P3a amplitude was seen for participants high on narcissism (i.e., 75th percentile) who took a 'selfie' and later received validation via likes on their uploaded photo (i.e., selfie + likes condition) relative to those who took a selfie (i.e., selfie only condition), $B = 0.752$, $SE = 0.261$, 95% CI [.233, 1.271], and relative to those in the control condition, $B = 0.543$, $SE = 0.269$, 95% CI [.007, 1.079].

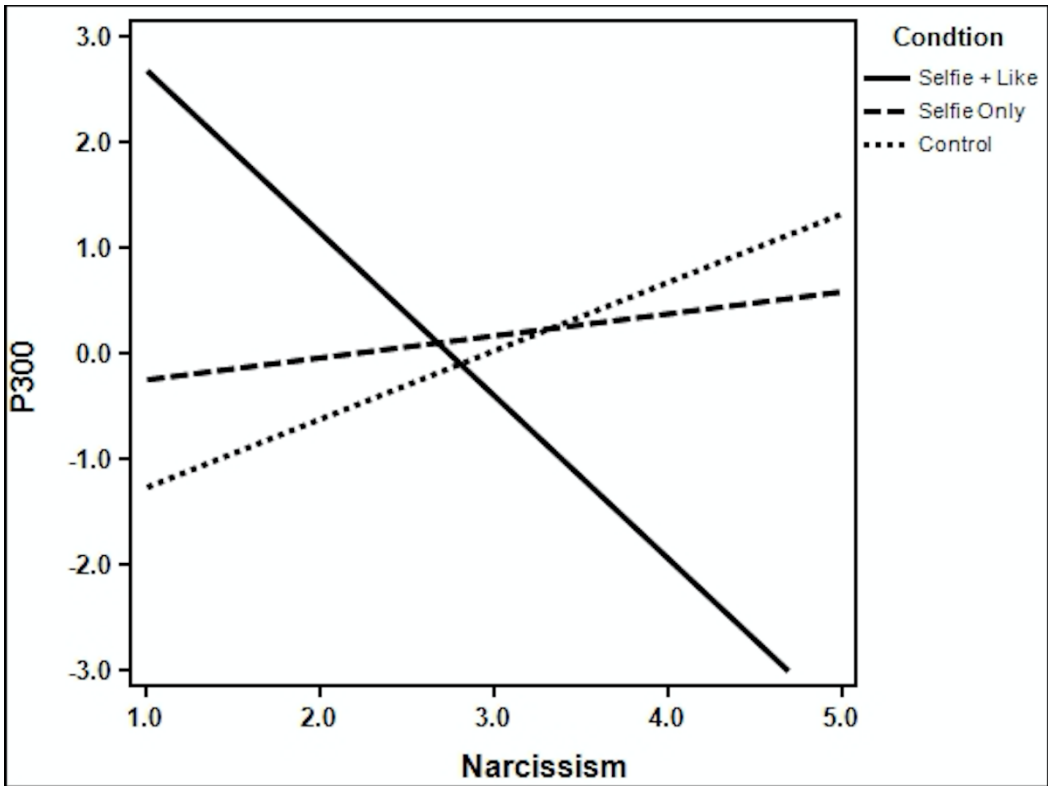

Figure 1: Multiple regression analysis.

A similar analysis then tested whether narcissism interacted with condition to impact self-reported presence of meaning in life which was included as an exploratory measure. This analyses revealed a significant narcissism x condition interaction, $F(2, 76) = 4.232$, $p = .018$, $R^2 = .099$. Results revealed a non-significant effect of condition on reported presence of meaning in life for participants low on narcissism (25th percentile), $F(2, 76) = 0.540$, $p = .585$. However, even for participants high in narcissism (75th percentile), there was a non-significant effect of condition on reported presence of meaning in life, $F(2, 76) = 1.122$, $p = .331$.

Moderated Mediation Analyses

A conditional process analysis (i.e., moderated mediation) with bias-corrected bootstrapping with 5,000 resamples (Hayes, 2013) then examined the indirect effect of P3a amplitude on the interactive effects of narcissism and condition on self-reported presence of meaning in life. This analysis revealed a significant index of moderated mediation, *Index* = 0.318, *SE* = 0.227, 95% CI [0.014, 0.998]. A non-significant indirect effect of P300 activity on the effect of condition for self-reported presence of meaning in life was found for participants low on narcissism *Effect* = .005, *Boot SE* = .060, 95% CI [-.121, .135]. However, for participants high in narcissism (75th percentile), there was a significant indirect effect of P3a amplitude for those in the 'selfie + likes' condition relative to the others on self-reported presence of meaning in life, *Effect* = .132, *Boot SE* = .086, 95% CI [.008, .358]. These results suggest that taking a selfie *and* receiving feedback via 'likes' on social networking sites is necessary to reduce vigilance for people high in narcissism and by doing so restores their sense of self-reported meaning in life. On the other hand, people low on narcissism do not appear to find the use of selfie posting or selfie posting with feedback (likes) helpful in reducing vigilance or restoring presence of meaning.

5. General Discussion

The current research aimed to extend literature on social exclusion in narcissism by examining the use of selfie posting on social media to buffer the effects of ostracism. We also wanted to examine the need for social affirmation and admiration in the reduction of distress following social exclusion. This was assessed using highly realistic experimenter generated feedback in the form of Instagram 'likes' which the participant believed to be coming from Instagram users.

Findings supported hypothesis one predicting that the selfie and likes condition would result in a significant reduction of distress in participants high on narcissism, and hypothesis 1.1 predicting no significant effect of condition on distress levels for participants low on narcissism. These findings support the psychodynamic view of narcissism as a confident mask compensating for an insecure core (Akhtar & Thomson, 1982), and adds significant contribution to narcissism and social exclusion research suggesting that narcissists no longer need to maintain real relationships in order to gain affirmation as positive online feedback is sufficient.

Hypothesis two predicting a significant reduction of anxiety in the selfie only condition compared to the control condition for participants high on narcissism was not supported. The current study aimed to investigate whether the self-presentation alone would buffer the effects of social exclusion or if feedback was necessary. Social-cognition theories suggest narcissism is characterised by grandiosity and a feeling of superiority (Raskin & Hall, 1979). Following these theories, self-relevant processing should activate brain regions associated with reward in narcissistic individuals. The current finding suggests this might not be the case, instead it

supports a psychodynamic view of narcissism in which the confident exterior is belied by a vulnerable sense of self. Research has indeed shown that highly narcissistic men respond to self-relevant processing with greater negative affect (Jauk et al., 2017). Using fMRI Juak et al., (2017) examined neural responses to viewing one's own face as opposed to the faces of others and found highly narcissistic men displayed heightened activation of the dorsal and ventral anterior cingulate cortex. The current study provides further support for this psychodynamic view of narcissism through the lack of reduction of distress following selfie taking and uploading.

Hypothesis three predicting participants scoring high on the NPI would also score highly on hedonistic pursuits following selfie posting and selfie posting with feedback, while those scoring low on the NPI would score high on eudaimonic pursuits was not supported by the current findings. This was included as an exploratory measure however, we did expect that selfie posting and likes would increase happiness in narcissists as they tend to follow pursuits for happiness rather than meaning (Buelow and Brunell, 2014). Interestingly, findings from the current study actually suggest that narcissists gain meaning in life from posting selfies to Instagram and receiving positive feedback from external sources. These findings suggest that even though narcissists seek out hedonistic pursuits and do not focus on finding meaning, their superficial self-presentation behaviours on social media and positive affirmation results in a sense of meaning they weren't even seeking. This finding supports research by Abeyta, Routledge, and Sedikides (2017), who suggested that while the general population find meaning in intrinsic goals (eg. Charity, health, maintaining relationships) narcissists derive meaning from extrinsic goals (eg. money, fame status).

Meaning in life positively impacts psychological health and understanding how people obtain meaning is an important area of research. Prior to this 2017 study research had focused on narcissists extrinsic pursuits but failed to understand why they sought out these goals. Abeyta et al., (2017) has suggested one reason why narcissists are motivated to pursue extrinsic goals. The current study significantly adds to this research by suggesting that social networking sites provide narcissists with a platform to pursue extrinsic goals through self-promotion (selfies), and by doing so gain a sense of meaning in life. This could have implications for their psychological health and may contribute to reducing negative reactions to existential threats, an area for future research.

5.1 Theoretical and Practical Implications

There has been a substantial amount of research demonstrating that narcissists display heightened reactions to social exclusion, however few have gone beyond self-report measure. This may be due to social-cognition theory that suggests narcissism to be characterised by feelings of superiority, giving little reason to look beyond the positive self-reports. However, recently research supporting the psychodynamic view of narcissism has grown bringing light to the insecurity behind narcissists selfish quest for social praise. One such study was that by Juak et al., 2017 who suggested there may be vulnerable aspects of subclinical narcissism not seen in self-reports but identifiable through fMRI. The current study supports this view demonstrating the importance of positive social feedback and approval to relieve personal insecurity in narcissists following social exclusion, and extends it to social media platforms suggesting online affirmation of self-presentations are sufficient to mask narcissists social pain. Narcissists appear to have found a happy home to display grandiose behaviour and self-presentation without the

dilemmas they face in real life interactions. Narcissism and social media are both increasing over time and research has shown that narcissists spend more time posting selfies on social networking sites, but also that the amount of selfie posting on these sites is increasing the level of narcissism (Halpren, Velenzuela & Katz, 2016) suggesting a vicious cycle. Selfie posting and blatant self-presentation has become socially acceptable and possibly even the norm. It is possible that we are currently in the process of creating a heavily narcissistic society that caters to narcissistic pursuits rather than recognize them as problematic.

Narcissists present an image they don't necessarily feel. The current study has addressed this by using a combination of self-reports and neural reports which together provide a more complete picture of how narcissism relates to the psychological processes involved in social exclusion and reactions to social exclusion. The current study is the first of its kind and has highlighted further areas of research on narcissism. It is becoming clear that research around interventions for narcissists should focus on creating a sense of security and reducing the amount of social approval they receive. For example, Mark Zuckerburg, the founder of Facebook, believes social connection is the key to unlocking prosocial behaviour on a societal scale, and has spent billions on initiatives to globalize social connection (Chaykowski, 2017). However, research on social media and Facebook, coupled with our findings here, demonstrate a clear dark side to social connection via the internet. Narcissists are fed by admiration and affirmation and the current study has suggested social connections via the internet provide this without the need for real life interaction. Social connection does not unlock pro social behaviours for narcissists, instead it could be feeding into a viscous cycle of masking insecurities and increasing narcissistic tendencies, the antithesis to genuine social connection.

Social networking site founders may need to re-evaluate the way in which people can present themselves online and work toward making sites such as Facebook and Instagram less of a stage for narcissists and a more genuine presentation of the self. This may not only help narcissists but could have an impact on cyber bullying, social comparison, and anxiety in younger generations who are spending a substantial part of their lives living through a screen. Understanding narcissists and their use of social networking sites could provide much needed insight into how to tailor these sites to combat increasing levels of narcissism.

5.2 Limitations

Although the current study has put forth evidence of social media use as a way for narcissists to recover from anxiety following social exclusion we must first consider possible methodological limitations.

Firstly, although there was a large range of ages and ethnicity, all participants in the current study were undergraduate psychology students at the University of Canterbury and this limits the ability to generalize the result to a wider population. It is also possible that psychology students may have an understanding of the way experiments are run and what the questionnaires are looking at, thus they could provide answers they think are more desirable. As previously mentioned narcissists are highly unlikely to self-report distress, the inclusion of neural measures (EEG) removed the possibility of false reports on this measure. Future research should include a larger and more diverse sample in order to generalize results to a wider population. A combination of neural and self-report measures should continue to be used in order to gain a more complete picture of the social issues surrounding narcissism and exclusion.

Secondly, a number of participants stated on their questionnaires that they were already aware of the purpose of Cyberball. However, a multiple regression analysis including participants' knowledge of Cyberball revealed all results were relatively unchanged.

Furthermore, no baseline measure of distress was taken. Participants distress was measured following Cyberball and again after their condition exercise (selfie, selfie + likes, control). This revealed that narcissists show a significant reduction of distress after posting a selfie and receiving feedback but we are unable to say whether this reduction returns them back to their base line, if they fail to reach their baseline, or if selfie posting and likes results in them displaying less distress than measured at their baseline.

5.3 Future research and Conclusion

The use of both self-reports and neural-reports has significantly extended research around narcissism and exclusion by highlighting a sensitive and insecure core that has not been observable through self-reports alone. It is important that future research continues to use a combination of measures to gain a more complete picture and understanding of the underlying characteristics of narcissism and the possible recovery methods they use in times of distress.

Research has suggested that younger generations are becoming more narcissistic and it is possible that including younger participants such as high school students would provide an even fuller image of narcissists reactions to social exclusion, and the buffering effects of selfies and feedback. Furthermore, recent research has suggested that highly narcissistic men respond to self-relevant processing (viewing their own face) with more negative affect (Jauk et al., 2017)

thus, it would be interesting to investigate the posting of pictures not including the self, combined with feedback (likes) to examine the importance of self-presentation or whether likes on social networking sites are the real glue holding the narcissists grandiose mask in place.

Future research should also examine the long-term changes in distress following selfie posting and likes. This would help to understand how long the reduction of distress lasts and once it dissipates whether uploading another selfie and receiving likes has the same effect.

With more research in the area of narcissism and social exclusion using neural measures it is becoming more apparent that narcissists possess an underlying sense of insecurity that they compensate for through grandiose and confident self-presentations. Understanding the extent of insecurity and where it comes from could help practitioners develop interventions to instill a sense of security in narcissistic individuals which may allow them to form true, meaningful and supportive relationships with others.

In summary, the current research demonstrated that the use of selfie posting on social media and gaining validation through ‘likes’ reduces distress felt by narcissist following social exclusion. Thus, significantly adding to research in the area of narcissism and social exclusion and paving the way for future research in this area.

6. References

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7. Appendices

Appendix (A) – Consent Form

Date:_____/_____/_____ Session #:_____ Participant #:_____

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PARTICIPANT CONSENT FORM

- I have read and understood the description of the above-mentioned project and have had the opportunity to clarify any concerns.
- I understand that my participation will involve completing a confidential questionnaire, if I agree to take part in the research.
- I understand that I am eligible for course credit (for PSYC105/106).
- I understand that participation is voluntary and I can withdraw from the study at any time.
- I understand the data I have provided will be deleted after 5 years.
- I agree to publication of results, with the understanding that any information or opinions I provide will be kept confidential. Also that any published or reported results will not identify my name or personal information.
- I agree to follow instructions provided by the experimenter in order to ensure my own safety.
- I understand that all data collected for the study will be kept in locked and secure facilities and will be destroyed after five years.
- I am satisfied with all the measures that will be taken to protect my identity and ensure that my interests are protected.
- I understand the risks associated with taking part and how they will be managed.
- I understand that I am able to receive a report on the findings of the study or further information by contacting the researcher at the conclusion of the project, Dr. Kyle Nash: kyle.nash@canterbury.ac.nz.

- If I have any complaints, I can contact the Chair of The Human Ethics Committee of the University of Canterbury (HEC), Private Bag 4800, Christchurch (human-ethics@canterbury.ac.nz)

By signing below, I agree to participate in this research project (By signing the consent form I indicate that I understand and agree to the research conditions).

I, (your name)_____, consent to participate in

'Personality and the Brain', conducted by Dr Kyle Nash and Andre Johansson.

I have understood the nature of this project and wish to participate. I am not waiving any of my legal rights by signing this form. My signature below indicates my consent.

Participant Signature and Date _____

Researcher Signature and Date _____

If you have any queries or concerns please do not hesitate to contact Andre Johansson at andre.johansson@pg.canterbury.ac.nz

Appendix (B) – Information Sheet

INFORMATION SHEET

PSYC211 Inlab Participants

Study Name: Personality and the Brain

Researchers: Dr. Kyle Nash, Department of Psychology, University of Canterbury
Andre Johansson, Department of Psychology, University of Canterbury

Purpose of Research?
This research investigates patterns of relations among participants' personality dispositions and personal orientations, experiences, preferences, and thought processes. It looks into social interactions as well as the interface between humans and computers. It will add to international researchers' growing understanding of how basic processes that underlie personality differences relate to important social phenomena.

What Will You Be Asked To Do?
There are two parts to this study. Part one focuses on personality and social interactions, part two is a human computer interface study. You will complete several questionnaires that assess personality traits along with exercises that assess social interaction. You may also be required to complete tasks assessing how the brain processes personal digital information. There are several parts to this study, of which you will be asked to do a subset. In total, the study session will take about 30 minutes to 1 hour to complete. The several parts that you may be asked to complete are as follows:

a) You will rate personality on various questionnaires with items such as, "I am an active person"

b) You will be asked demographic questions about your age, gender, and ethnicity, as well as questions about your cultural background and religious orientation.

c) You will be asked to take part in an online ball toss game against other participants in the study.

d) You may be asked to complete a task processing personal digital information including sound information.

e) You may be asked to upload a selfie to Instagram using your smartphone and current Instagram account.

Risks and Discomforts:
There are no obvious risks of participation in this research, but some of the questions may be challenging or may require that you reflect on aspects of yourself or life that you may be uncomfortable with. You are free to decline to respond to any such materials.

Benefits of the Research and Benefits to You:
This research may benefit society by contributing to a better understanding of personality processes that underlie people's opinions, values, goals, preferences, and personalities, more generally. Ultimately, we hope to better understand how personality affects the way we interact socially, and process personal digital information.

You may also derive personal benefit from participation in this research insofar as it may contribute to your having a more concrete understanding of the process of social science. Moreover, many of the questions involve self-reflection, and past participants have commented that they appreciated the opportunity to reflect on themselves and their lives.

Voluntary Participation:
Your participation in the study is completely voluntary. Whether you decide to volunteer, or not, will not influence your relation with the researchers involved in the study, or with the University of Canterbury, either now, or in the future.

Withdrawal from the Study:
You can stop participating, or skip questions or sections in the study at any time, for any reason, if you so decide. If you decide to stop participating, or to skip certain parts, you will still be eligible to receive the points for agreeing to be in the project. Your decision to stop participating, or to refuse to answer particular questions, will not affect your relationship with the researchers, the University, or any other group associated with this project.

Confidentiality:
All information you supply during the research will be held in confidence and your name will not appear in any report or publication of the research. Only research staff will have access to the data, and your name or other identifying information (such as your student number or email address) will not be stored in the same file or location as the data.

Questions about the Research:
If you have questions about the research in general or about your role in the study, please feel free to contact Dr. Kyle Nash (phone: +64 3 364 2987 ext. 4947; email: kyle.nash@canterbury.ac.nz). This research has been reviewed by The Human Ethics Committee of the University of Canterbury (HEC). If you have any questions about this process or about your rights as a participant in the study, please contact the Chair of The Human Ethics Committee of the University of Canterbury, Private Bag 4800, Christchurch (human-ethics@canterbury.ac.nz).

Appendix (C) – Condition 1 & 2 First Handout

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Personality and the Brain - Task Inforn

Uploading a Selfie

You have completed tasks looking at how the brain reacts to basic stimuli, now we would like to measure how the brain reacts to more complex personally relevant images and stimuli. The researchers are also interested in how hashtags influence viewer responses. Using hashtags on Instagram means our photos reach more people. Past research has found fitness hashtags generate a substantially larger number of likes compared to other hashtags in a shorter period of time regardless of the photo they are attached to.

What you will be doing: We would like you to either take a selfie and upload it to Instagram or upload a selfie you have taken in the past that has not already been uploaded to Instagram, using fitness related hashtags. The experimenter will take you to the next room so you will have privacy to complete this task. The following guidelines need to be followed:

1. The image must stay as the default Instagram square size. This is to ensure that we keep images consistent across participants.
2. You may edit the image with filters, or other editing tools such as brightness and contrast.
3. Please use the following fitness related hashtags on your picture: #selfie, #fitspo #fitspiration.

Once you are happy with your selfie, please let the experimenter check that the right hashtags have been used and the size has not been changed.

You can delete the photo at the end of the study if you wish to.

Please log into your Instagram account then raise your hand to let the experimenter know you are ready to start this task. If you would like to keep the EEG headset on for your selfie just let the experimenter know.

Appendix (D) – Condition 1 second handout

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Personality and the Brain - Task Information Sheet

Personally Relevant Visual Stimuli

Thank you for uploading a selfie to Instagram. The researchers would like to see how viewers respond to the fitness hashtags used as past research has found these hashtags to generate a large number of likes in a short period of time. We would also like you to see how others respond to these hashtags. We will re-fit you with the EEG and the experimenter will start a program designed to refresh the screen every 10 seconds so you can see whether others are liking or commenting on your photo.

After approximately 5 minutes the software will stop refreshing Instagram. A loading wheel is seen when the screen is refreshing. Please signal the experimenter when this stops.

The experimenter will have started the refresh program so sit back and take in any feedback you receive.

Appendix (E) – Condition 3 Handout 1

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Personality and the Brain - Task Information Sheet

Viewing visual Stimuli

You have completed tasks looking at how the brain reacts to basic stimuli, in this case sound. Now we would like to measure how the brain reacts to more complex visual stimuli.

What you will be doing: You will look at an image on Instagram for three minutes. Although this task may seem boring we can gain a lot of information through the EEG during this task so please try to stay interested and focused.

Please log into your Instagram account. Once logged in raise your hand and the experimenter will open the image for you.

Appendix (F) – Participant Debrief

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Personality and the Brain

DEBRIEFING – Psyc211

Thank you very much for helping us with this research. Your efforts are very much appreciated. This page outlines the main questions that this research was designed to answer.

Past research has found that self-loving people are more likely to post selfies on social media sites such as Instagram and strive for a high number of followers. Research has been very focused on why certain people post selfies, the current research aims to build on this by investigating whether selfie posting helps self-loving individuals overcome anxiety, whether posting a selfie alone is enough, or if feedback (likes) is required to recover from adverse events.

You and the other participants completed various, different versions of the materials. You all took part in a game of Cyberball where you were excluded from the game. In line with past research and our hypothesis, we expected that participants scoring highly on self-love measures would display higher levels of anxiety after being ostracised in Cyberball than low self-loving individuals. Anxiety was assessed using the electroencephalography (EEG) measurement. Self-love was measured using a variety of personality questionnaires. Moreover, our main hypothesis was that we would see a greater improvement in anxiety

levels in self-loving individuals after uploading a selfie alone, and uploading a selfie that received feedback, while self-loving participants in the no selfie feedback would maintain a higher level of anxiety post Cyberball. Furthermore, happiness and meaning were measured using the Meaning in Life Questionnaire, it was expected that self-loving individuals would score more highly towards happiness, as they would seek an instant, short lasting boost in mood over long-term life meaning.

We are sorry that we were not able to give you all these details up front, before you began the study. Doing so could have spoiled the study because some participants might have altered their responses based on their expectations. Accordingly, the study required some deception about some of the materials. You were all required to participate in a game of Cyberball where you were excluded after six initial passes from the other players. You were led to believe you were playing against other participants in the study. It is important you be assured that you were not playing against other participants. The ball passes were manipulated by the experimenter through a computer program to exclude you from the game in order to induce anxiety. Finally, participants who received feedback on their photos were not receiving feedback from their Instagram followers. A fake screen was used with an automatic counter to ensure all participants in the feedback condition received the same number of likes.

If you wish to acquire a summary of the results of this research or you have a question about the research in general or about your role in the study, please feel free to contact Dr. Kyle Nash (phone: +64 3 364 2987 ext. 4947; email: kyle.nash@canterbury.ac.nz). This research has been reviewed by The Human Ethics Committee of the University of Canterbury (HEC). If you have any questions about this process or about your rights as a participant in the study, please contact the Chair of The Human Ethics Committee of the University of Canterbury, Private Bag 4800, Christchurch (human-ethics@canterbury.ac.nz). If completing any of the materials has raised personal issues which you find distressing, the following contacts are provided for your convenience:

UC Health Center counselling services, +64 3 364 2402 (confidential, professional counseling for UC students)
Student Support and Services at +64 3 364 2350 or +64 3 364 2987 or email studentdevelopment@canterbury.ac.nz (confidential peer counseling by UC students for UC students).

Thank you once again for your help with this important research. For references to related publications, please see the principle investigator's published works, at https://scholar.google.co.nz/citations?user=ZmERmc0AAAAJ&hl=en

Sincerely,
Dr Kyle Nash and Andre Johansson (Department of Psychology, University of Canterbury)

If you have any queries or concerns please do not hesitate to contact Andre Johansson at andre.johansson@pg.canterbury.ac.nz or Dr Kyle Nash at kyle.nash@canterbury.ac.nz

Appendix G – Like Generating Programme